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71 Applicant: UNILEVER PLC
Unilever House Blackfriars P O Box 68
London EC4P 4BQ(GB)

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71 Applicant: UNILEVER NV
Burgemeester s'Jacobplein 1 P.O. Box 760
NL-3000 DK Rotterdam(NL)

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72 Inventor: Rubin, Fred Kurt
429 Woodland Place
Leonia New Jersey(US)

72 Inventor: Van Blarcom, David
56 High Street
West Milford New Jersey(US)

74 Representative: Fransella, Mary Evelyn et al,
Unilever PLC Patent Division P.O. Box 31 Salisbury
Square House Salisbury Square
London EC4P 4AN(GB)

54 Viscous compositions containing amidobetaines and salts.

57 Aqueous compositions containing alkylamido betaines exhibit surprisingly high viscosities in the presence of certain water-soluble inorganic or organic salts, without the need for additional thickening agents. A first group of salts is effective both in the presence and absence of anionic surfactants, while a second group is effective only in the presence of anionic surfactants. The compositions may be used for many household and personal cleaning products, for example, lavatory cleaners, dishwashing compositions and shampoos.

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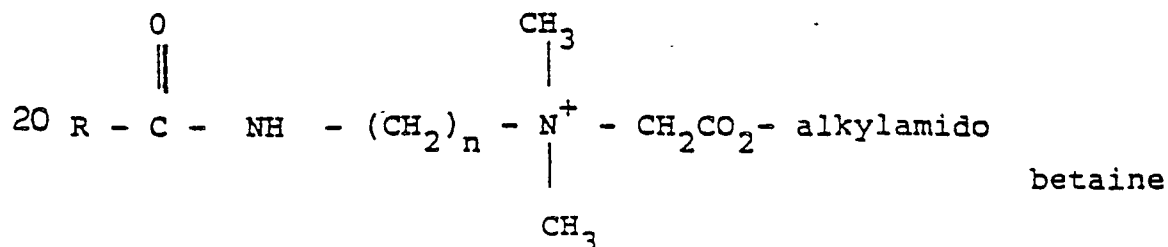
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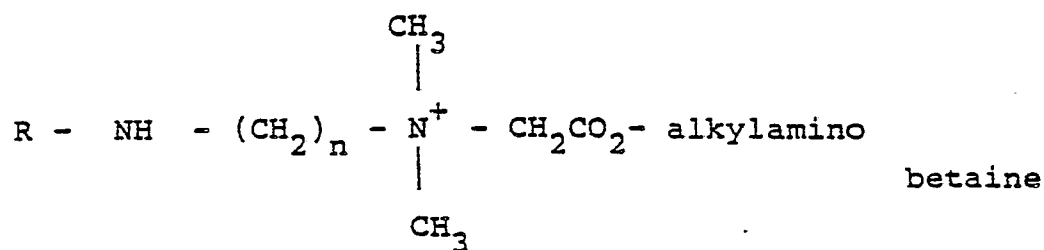
VISCOUS COMPOSITIONS CONTAINING AMIDO BETAINES AND SALTS

The present invention relates to viscous liquids, pastes, and gels useful in various cosmetic, toiletry, cleansing and other compositions. More specifically, the present invention relates to viscous liquids, pastes, and
 5 gel compositions containing as essential ingredients alkylamido betaines, certain salts, and water.

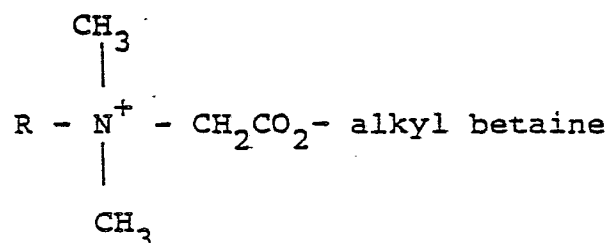
Many cosmetic, toiletry, and cleansing compositions contain amphoteric and zwitterionic surfactants. These
 10 surfactants may serve as detergents which either replace or are in addition to anionic detergents. Betaines constitute one of the more important classes of amphoteric and zwitterionic surfactants used in such compositions.

Included in the class of betaine surfactants are alkylamido
 15 betaines, alkylamino betaines, and alkyl betaines.





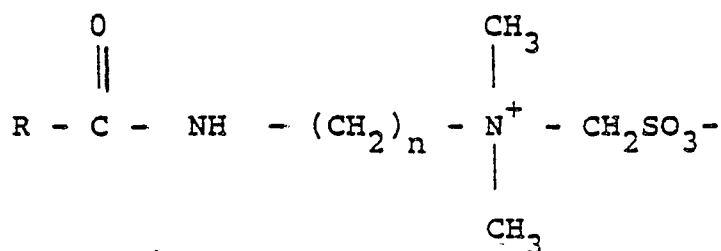
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20 wherein R represents a fatty alkyl or alkenyl chain; n is an integer, usually 3.

For example, cocoamido betaine, cocoamino betaine and coco betaine are commercially available in the USA from
25 Lonza Incorporated, the Stepan Chemical Company, and the Miranol Chemical Co.

Sulphobetaines, wherein the carboxylate groups of the betaines described above are replaced by sulphonate
30 groups, are also commercially available. For example, the structure of cocoamido sulphobetaine may be represented by the formula:



5

wherein R and n have the same meanings as above.

10

Betaines are useful in a variety of compositions as a result of numerous favourable properties. In particular, they are mild, high foaming, and biodegradable surfactants and wetting agents. In addition, they are compatible with 15 high levels of detergency builders, electrolytes, alkalis and acids. This combination of properties makes betaines useful in a variety of cleansing and industrial compositions such as alkaline and acid cleaners, light and heavy duty cleaners, metal finishing compositions, and 20 electroplating compositions. The use of betaines in heavy duty cleaners, for example, is described in US 3 876 563.

Betaines also provide good conditioning to skin and hair. As a result, betaines are frequently used in 25 shampoo, toiletry and cosmetic compositions. The use of betaines for these applications is described in US 3 328 307, US 3 980 769 and US 4 110 263.

As a result of the compatibility of betaines with 30 quaternary ammonium compounds and other germicides, betaines are also used in disinfectant and sanitizing cleansers as well as in antibacterial scrubs. Textile finishing and dye compositions are also known to benefit from the beneficial wetting, conditioning and levelling 35 action of betaines.

It is frequently desirable for a cleaning composition to contact dome-shaped or vertical surfaces for prolonged periods of time. Freely-flowing liquids are unsuitable for this purpose since they do not remain in
5 contact with such surfaces long enough. In order to avoid this problem, thickeners are added to the cleansing composition in order to increase viscosity and to reduce the ability of the composition to flow. Some examples of cleansing compositions which are advantageously thickened
10 for this reason are shampoos, dishwashing detergents, toilet bowl cleaners, wall cleaners, and the like.

In addition, viscous compositions such as gels are commercially advantageous. Many consumers prefer viscous
15 liquids and gels to non-viscous liquids because of the impression of strength conveyed as well as other aesthetic qualities. Moreover, viscous liquids and gels can be dispensed by methods other than by simple pouring. For example, viscous liquids and gels can be dispensed from
20 tubes by squeezing.

Traditionally, the viscosity of aqueous solutions has been increased by the addition of thickening agents such as proteins, pyrogenic silicas, polyoxyethylene
25 polymers, and natural and synthetic cellulosic gums such as hydroxypropylcellulose, methylcellulose, carboxymethylcellulose and hydroxymethylcellulose. The use of such thickening agents is disadvantageous, however, in view of the high cost and difficulty in handling involved
30 in the use of such agents. Moreover, if a clear viscous liquid, paste or gel is desired, the use of thickening agents usually adds to the opaqueness of the composition.

Viscous compositions which do not require
35 traditional thickening agents are also known. An example

of such a composition is described in US 4 107 067 (Procter and Gamble). These compositions are said to be especially well adapted for use as detergents which are directly applied to stains and soils on fabrics during pretreatment
5 prior to aqueous laundering. The ingredients of the detergent composition disclosed there include an electrolyte and a nonionic surfactant. The electrolyte may be an alkali metal halide, sulphate, carbonate, nitrate or phosphate. The nonionic surfactant is the condensation
10 product of a polyalkylene oxide and an aliphatic or alkyl aromatic hydrophobic compound. According to US 4 107 067, the addition of an appropriate amount of electrolyte converts concentrated aqueous liquid solutions of the nonionic surfactant to gelatinous liquids and flowable
15 gels. Gelatinous liquids are defined in this patent as those having a Brookfield viscosity in the range of about 500 cps to 10 000 cps at 22°C. Flowable gels are defined as those which have Brookfield viscosities in the range of about 10 000 cps to 50 000 cps at 22°C.

20

Lonza Incorporated has disclosed another method for forming viscous compositions in the absence of traditional thickeners. A publication giving product information on Lonzaine C, which is a solution containing cocoamido
25 betaine and NaCl, discloses that "Lonzaine C in combination with most anionic surfactants potentiates viscosity to permit formulations ranging from viscous liquids to ringing gels". The Lonza compositions are said to be useful in a variety of cosmetic, toiletry and detergent applications.

30

US 4 107 067 and the Lonza publication are unusual in that they disclose viscous aqueous compositions in the absence of additional thickening agents. The US patent, however, is restricted to viscous detergents containing
35 polyalkylene oxide-type nonionic surfactants. The Lonza publication is restricted to viscous compositions which

require anionic surfactants in addition to cocoamido betaine.

There is a need, therefore, for viscous compositions which contain amphoteric or zwitterionic surfactants and which require neither anionic detergents nor traditional thickening agents.

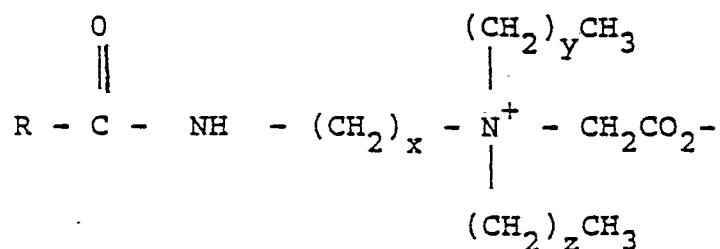
The present invention is based on the discovery that aqueous solutions containing alkylamido betaines and certain water-soluble inorganic or organic salts can provide compositions of remarkably high viscosity. Some of these salts increase the viscosity of alkylamido betaines only in the presence of micelle-forming anionic surfactants, whereas others will produce such a viscosity increase both in the presence and in the absence of anionic surfactants. It has been found that the salts of the latter class in combination with anionic surfactants increase the viscosity of aqueous solutions containing alkylamidobetaines synergistically.

Accordingly the present invention provides an aqueous viscous liquid, paste or gel composition comprising

25

a) 5 to 25% by weight of one or more amido betaines of the general formula I:

30



wherein R is an alkyl or alkenyl chain containing 9 to 17 carbon atoms, x is an integer from 2 to 4, y is 0 or an integer from 1 to 3, and, z is 0 or an integer from 1 to 3;

5

b) 2.5 to 40% by weight of one or more water-soluble inorganic and/or organic salts, the inorganic salt being selected from the group consisting of:

10 b)(i) sulphates of metals from groups IA, IIA, IIB and IIIA of the Periodic Table, sulphates of non-metallic ions, and alkali metal carbonates,

and/or from the group consisting of:

15

b)(ii) sulphates of metals from group IB of the Periodic Table, alums, alkali metal sesquicarbonates, alkali metal tripolyphosphates and pyrophosphates, potassium chloride, ammonium chloride, and alkali metal
20 silicates;

the organic salt being incapable of forming micelles and being selected from the group consisting of:

25 b)(iii) the citrates, tartrates, succinates, and carboxymethyloxysuccinates of metals from Groups IA, IIA, IIB, and IIIA of the Periodic Table and the citrates, tartrates, succinates and carboxymethyloxysuccinates of ammonium ions;

30

and/or from the group consisting of:

b)(iv) the alkali metal salts of acetic acid, and the alkali metal salts of nitrilotriacetic acid;

c) optionally, one or more micelle-forming anionic surfactants, and

d) water,

5

with the proviso that when no anionic surfactant is present the salt or salts (b) is or are present in a total amount of at least 5% by weight, and is or are selected from groups b(i) and/or b(iii) listed above,

10

the composition having a Brookfield viscosity within the range of from 150 to 1 500 000 cp at ambient temperature.

Viscous compositions according to the present
15 invention are useful in cleansing, toiletry, cosmetic and other applications. It will be noted that according to the invention high viscosities are attainable without recourse to traditional thickening agents.

20 The compositions of the present invention are viscous liquids, pastes, or gels. Viscous liquids are capable of flowing, although the flow is hindered. For the purposes of the present invention, the Brookfield viscosities of viscous liquids may be in the range of 150
25 to 10 000 cps, and preferably 500 to 7500 cps at ambient temperatures.

Pastes and gels, on the other hand, are sufficiently viscous that they hardly flow at all unless pressure is
30 applied. The pastes and gels of the present invention have Brookfield viscosities of about 10 000 to 1 500 000 cps, preferably about 100 000 to 1 000 000 cps and most preferably 200 000 to 700 000 cps at ambient temperatures.

35 The liquid, paste or gel may be clear or opaque. By clear is meant that the compositions are transparent or

translucent.

Many of the gels defined by the present claims are "ringing" gels. This means that they vibrate for short
5 periods of time when they or their containers are struck with sufficient force.

The essential components of the composition of the present invention in its broadest aspect are at least one
10 alkylamido betaine, at least one salt as defined above, and water. The composition may also contain one or more optional components, notably an anionic surfactant. The choice and amount of salt depends on whether or not an anionic surfactant is present.

15

Thus the invention may be regarded as having three principal preferred embodiments. According to the first embodiment the composition of the invention comprises

- 20 a) 5 to 25% by weight of an amido betaine as defined above,
- b) 5 to 40% by weight of one or more inorganic salts selected from the group (b)(i) above and/or
25 one or more organic salts selected from the group (b)(iii) above, and
- c) water.

30 In the second embodiment, in which an anionic surfactant is present, the composition comprises

- a) 5 to 25% by weight of an amido betaine as defined above,

b) 2.5 to 40% by weight of one or more inorganic salts selected from the group (b)(i) above and/or one or more organic salts selected from the group (b)(iii) above,

5

c) one or more micelle-forming anionic surfactants, and

d) water.

10

The amount of micelle-forming anionic surfactant present may vary between wide limits. It may advantageously range from 0.25 to 15% by weight, preferably 0.5 to 12.4% by weight. The range of 2.5 to 4.0% by weight 15 has been found to give especially good results.

It will be noted that the lower limit on the amount of salt or salts (b) present is lower (2.5%) in the presence of anionic surfactant than in the first embodiment 20 (5%), because of the viscosity-increasing contribution of the anionic surfactant.

The third embodiment of the invention concerns those salts that are effective only in the presence of anionic 25 surfactants. In the third embodiment the composition of the invention comprises

a) 5 to 25% by weight of an amido betaine as defined above,

30

b) 2.5 to 40% by weight, preferably 5 to 40% by weight, of one or more inorganic salts selected from group (b)(ii) above, and/or one or more organic salts selected from group (b)(iv) above,

35

c). one or more micelle-forming anionic

surfactants, and

d) water.

5 As in the second embodiment the amount of anionic surfactant present can vary between wide limits, for example, 0.25 to 15% by weight, preferably 0.5 to 12.4% by weight. The range of 0.25 to 4.0% is especially preferred for this embodiment.

10 In all three embodiments minor amounts of other conventional ingredients may of course be present provided that they do not interfere with the action of any of the specified ingredients.

15 In the compositions of the invention, the concentration of the alkylamido betaines is 5 to 25% by weight and preferably 10 to 20% by weight. The concentration of the salt is 5 to 40% by weight and
20 preferably 15 to 25% by weight. The remainder of the composition comprises water and any optional ingredients.

 The concentration of the salt is selected at least in part on the basis of the viscosity desired. In order to
25 form viscous liquids, the concentration of the salt is preferably about 10 to 19% by weight. When a thick paste or gel is desired, the concentration of the salt is preferably about 20 to 35% by weight.

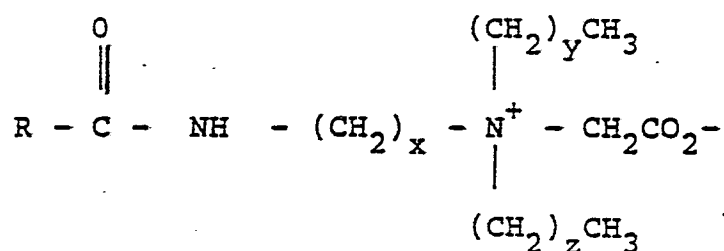
30 The concentration of the betaine depends on the concentration and viscosity-building effectiveness of the salt and on the type of composition desired. Higher concentrations of betaine are used as lower amounts of salt or less effective salts are present and as higher
35 viscosities are desired. In order to form a viscous liquid, the concentration of the betaine is usually less

than about 15% by weight and generally between 10 and 15% by weight. If a thick paste or gel is desired, the concentration of the betaine is usually greater than about 15% and generally between 15 and 25% by weight.

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The amido betaines useful in the present compositions may be represented by the general formula I:

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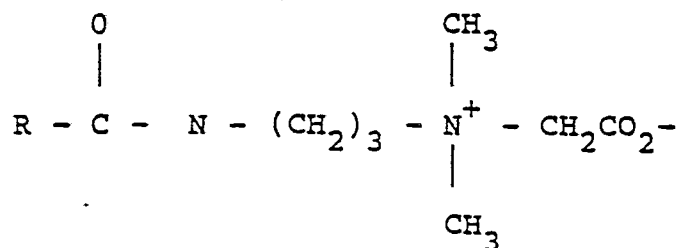
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(I)

wherein R represents an alkyl or alkenyl chain containing 9 to 17 carbon atoms, x is an integer from 2 to 4, y is 0 or 20 an integer from 1 to 3, and z is 0 or an integer from 1 to 3.

The preferred value of x is 3. The preferred values for y and z are both 0. R preferably is a fatty group 25 which contains 11 to 13 carbon atoms, most preferably in a straight chain. The preferable source of the R group is coconut oil. The preferred amido betaine may be represented by the formula II:

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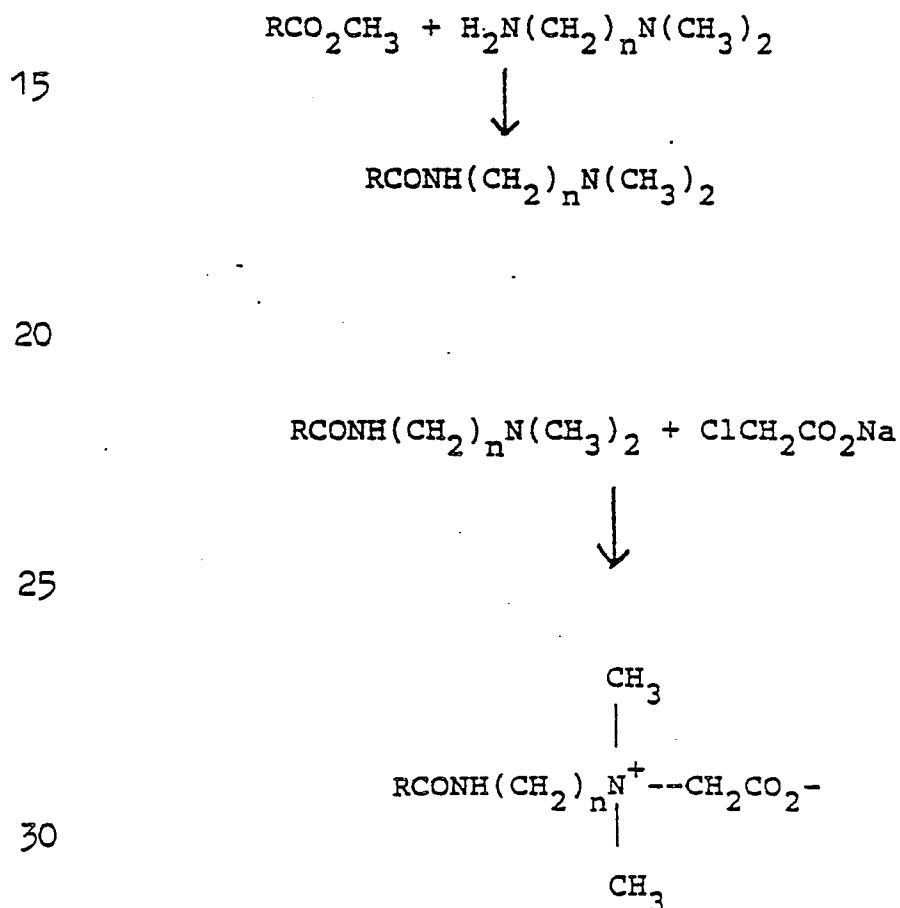


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(II)

wherein R represents an alkyl or alkenyl chain containing 9 to 13 carbon atoms.

The alkylamido betaines useful in the present
 5 compositions are commercially available in the USA from Lonza Incorporated under the trademark Lonzaine C; from the Miranol Chemical Co. under the trademark Mirataine CB; and from the Stepan Chemical Co. under the trademark Amphosol CA. The alkylamido betaines are also relatively simple to
 10 prepare by well known techniques according to the following equations:



wherein R is a fatty alkyl group and n is 2 to 4.

The type of betaine suitable for use in the compositions of this invention is very specific. Most betaines are not thickened in the presence of salts. It has been discovered that aqueous solutions only of
5 alkylamido betaines are thickened under these conditions. Examples of betaines which are not thickened by salts and which by themselves are, therefore, unsuitable for use in the present compositions include alkyl betaines, alkylamino betaines, alkyl sulphobetaines, alkylamino sulphobetaines,
10 and alkylamido sulphobetaines.

The form in which the amido betaines exists in solution depends on the pH. Under acidic conditions, the carboxylate groups are protonated. Under basic
15 conditions, the carboxylate groups are associated with whatever cations are available.

The salts of the present invention are water-soluble salts. By water-soluble is meant that the salt is soluble
20 in water to at least the extent of the minimum concentrations recited in the present claims.

Surprisingly, not all salts are capable of increasing the viscosity of aqueous compositions containing
25 the above-described amido betaines. The effect is very specific. Although a certain salt may increase viscosity, a closely related salt may not. No basis for predicting which salts will increase the viscosity of aqueous solutions of amido betaines is apparent.

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Salts which increase the viscosity of aqueous solutions of alkylamido betaines include the soluble sulphates of metals from group IA, IIA, IIB and IIIA of the Periodic Table.

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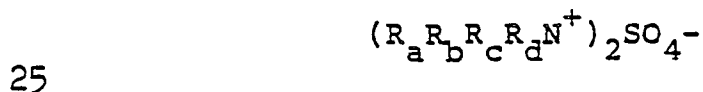
The preferred sulphates of metals from Group IA are

sodium sulphate and potassium sulphate. The preferred sulphate of metals from Group IIA is magnesium sulphate. The preferred sulphate of metals from Group IIB is zinc sulphate. The preferred sulphate of metals from Group IIIA is aluminium sulphate. The most preferred sulphates of metals from Groups IA, IIA, IIB, and IIIA are sodium sulphate and magnesium sulphate.

The term "sulphate" in the present context includes ions related to sulphates such as bisulphate and thiosulphate. The preferred bisulphates and thiosulphates are sodium bisulphate and sodium thiosulphate.

The cation of the sulphate may also be non-metallic. Suitable examples of non-metallic cations include ammonium, sulphonium, and phosphonium.

The preferred non-metallic ion is ammonium ion. The term "ammonium" refers to NH_4 as well as to substituted ammonium. Thus, ammonium sulphates may be represented by the formula:



In the formula, R_a , R_b , R_c and R_d , may independently be H, C_1 to C_4 alkyl, or C_2 to C_4 hydroxyalkyl.

30

Suitable ammonium groups include NH_4 ; methylammonium, dimethylammonium, trimethylammonium and tetramethylammonium; ethylammonium, diethylammonium, triethylammonium and tetraethylammonium; and ethanolammonium, diethanolammonium, triethanolammonium and tetraethanolammonium. The preferred ammonium sulphates are

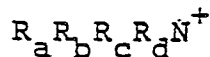
those in which all of the R groups are hydrogen and those in which one or more of the R groups is 2-hydroxyethyl, the remaining R groups being H.

5 The salt useful in the present compositions may also be an alkali metal carbonate. Suitable alkali metal carbonates include potassium carbonate and sodium carbonate.

10 The salt of the present compositions may also be an organic salt. Organic salts refer to salts in which the anion contains one or more organic groups. The cation may be metallic or non-metallic. Suitable examples of organic salts containing metallic cations include the citrates,
15 tartrates, succinates and carboxymethyloxysuccinates of metals from Groups IA, IIA, IIB and IIIA.

 The cation of the organic salt may also be non-metallic. Suitable examples of organic salts
20 containing non-metallic cations include the ammonium citrates, tartrates, and succinates.

 The term "ammonium" refers to NH_4 as well as to substituted ammonium. Thus, ammonium ions may be
25 represented by the formula:



30

 In the formula, R_a , R_b , R_c and R_d may independently be H, C_1 to C_4 alkyl, or C_2 to C_4 hydroxyalkyl.

35 Suitable ammonium groups include NH_4 ; methylammonium, dimethylammonium, trimethylammonium and

tetramethylammonium; ethylammonium, diethylammonium, triethylammonium and tetraethylammonium; and ethanolammonium, diethanolammonium, triethanolammonium and tetraethanolammonium. The preferred ammonium sulphates are
5 those in which all of the R groups are hydrogen and those in which one or more of the R groups is 2-hydroxyethyl, the remaining R groups being H.

Suitable organic salts include sodium citrate,
10 sodium tartrate, sodium succinate, potassium citrate, potassium tartrate, potassium succinate, ammonium citrate, ammonium tartrate, ammonium succinate, ethanolammonium citrate, ethanolammonium tartrate, ethanolammonium succinate, diethanolammonium citrate, diethanolammonium
15 tartrate, diethanolammonium succinate, triethanolammonium citrate, triethanolammonium tartrate and triethanolammonium succinate. A preferred organic salt is sodium citrate.

Particularly useful organic salts include the salts
20 of carboxymethyloxysuccinic acid described in US 3 692 685 (Lever Brothers Co) which is incorporated herein by reference. Typical of such materials are trisodium carboxymethyloxysuccinate, tripotassium carboxymethyloxysuccinate, trilithium carboxymethyloxysuccinate,
25 triammonium carboxymethyloxysuccinate, the monethanolamine salt of carboxymethyloxysuccinic acid, the diethanolamine salt of carboxymethyloxysuccinic acid, the triethanolamine salt of carboxymethyloxysuccinic acid, the tetramethylammonium salt of carboxymethyloxysuccinic acid,
30 tri(ethylammonium) carboxymethyloxysuccinate, the monoisopropanolamine salt of carboxymethyloxysuccinic acid, the diisopropanolamine salt of carboxymethyloxysuccinic acid, monosodium dipotassium carboxymethyloxysuccinate, disodium monopotassium carboxymethyloxysuccinate, the
35 morpholine salt of carboxymethyloxysuccinic acid, and the like.

The organic salts of the inventive compositions are incapable of forming micelles. Thus, anionic detergents such as alkyl sulphates, alkenyl sulphates, aralkyl sulphates, and alkaryl sulphonates, wherein the alkyl and alkenyl groups are derived from a fatty acid, and the corresponding ether sulphates are excluded from the list of organic salts recited in the groups (b)(iii) and (b)(iv) given above.

Although the presence of anionic surfactants is not essential and in some cases not desirable in the compositions, it has unexpectedly been found that there is a synergistic effect when both an anionic surfactant and one or more of the inorganic or organic salts identified above are present together with an alkylamido betaine. That this is so can clearly be seen from Example 3 below. Compositions 3A, 3B, and 3C all contain 15% by weight of cocoamido betaine and water. In addition, Composition 3A contains 15% sodium sulphate and has a Brookfield viscosity of 175 cps at ambient temperatures. Composition 3B contains, in addition to the betaine and water, 2.4% alpha olefin sulphonate and has a Brookfield viscosity at ambient temperatures of 55 cps. Composition 3C contains, in addition to the betaine and water, 5% sodium sulphate and 2.4% alpha olefin sulphonate and has a Brookfield viscosity at ambient temperatures of 2600 cps. The viscosity of 3C, which contains both sulphate and alpha olefin sulphonate, is clearly greater than what would be expected for combining compositions 3A and 3B, which separately contain sodium sulphate and alpha olefin sulphonate, respectively. It should be noted that composition 3C is unexpectedly viscous although it has one-third the amount of sodium sulphate as composition 3A. Therefore, one can obtain more highly viscous compositions at lower salt concentrations by adding a small amount of an anionic surfactant, as in the second embodiment of the present invention.

The salts which exhibit synergism in the presence of anionic surfactants in the compositions of the second embodiment of the invention are the same as those which unexpectedly thicken the compositions in the presence of 5 alkyl and alkenylamido betaines in the absence of anionic surfactants. They are the salts of groups (b)(i) and (b)(iii) given above.

The anionic surfactants which may optionally be 10 added to the compositions and which, together with the salt, synergistically enhance the viscosity, may be any anionic surfactant capable of forming micelles in aqueous solutions. Preferred anionic detergents are those that are sulphonated or sulphated. Advantageously the anionic 15 surfactant is selected from the group consisting of primary and secondary alkyl sulphates, alkyl ether sulphates, linear and branched alkylbenzene sulphonates, secondary alkane sulphonates, alpha-olefin sulphonates and dialkyl sulphosuccinates.

20

The sodium, potassium, magnesium, calcium, ammonium, mono-, di- and triethanolamine salts of sulphated fatty alcohols, as well as these salts of sulphated aralkyl and sulphonated alkaryl compounds, all of which have fatty 25 chains containing from 12 to 21 carbon atoms, are especially preferred. The sulphates described above may be the corresponding sulphate ethers wherein each molecule contains an average of from 1 to 12 and preferably 2 to 3 ethylene oxide units.

30

Suitable sulphated fatty alcohols include sodium lauryl sulphate, ammonium lauryl sulphate, sodium tallow alcohol sulphate and ammonium tallow alcohol sulphate.

35

Suitable sulphonated alkaryl compounds include sodium, magnesium and ammonium linear C₁₀-C₁₃

alkylbenzene sulphonates, for example sodium dodecylbenzene sulphonate, triethanolamine dodecylbenzene sulphonate and sodium laurylbenzene sulphonate.

5 Other preferred anionic surfactants are the dialkyl sulphosuccinates, especially the alkali metal, ammonium and magnesium salts of symmetrical and unsymmetrical di(C₄-C₁₂) alkyl esters of sulphosuccinic acid.

10 Suitable ether sulphates include the sodium, potassium, magnesium, calcium, ammonium, mono-, di-, and triethanol amine salts of alcohol ethoxy sulphates. The alcohol in the ethoxy sulphates may be any fatty alcohol containing 10 to 18 carbon atoms, preferably 12 to 15

15 carbon atoms, and most preferably 12 carbon atoms.

Preferred ether sulphates include sodium and ammonium lauryl ethoxy sulphate (2 moles E.O.), sodium and ammonium lauryl ethoxy sulphate (3 moles E.O.) and sodium and ammonium lauryl ethoxy sulphate (12 moles E.O.).

20

The anionic surfactants may be olefin sulphonates suchs as alpha olefin sulphonates. Suitable alpha olefin sulphonates include the sodium salt of alpha olefin sulphonate and sold in the USA under the trademark Bioterge 25 AS40 by the Stepan Co.; Surco AOS by Onyx-Millmaster Co.; AOS by Ethyl Corporation; or Sulframline by Witco Co. The structure of alpha olefin sulphonates may be represented by the formula R-CH=CH-SO₃Na wherein R is an alkyl or alkenyl group containing 10 to 14 carbon atoms.

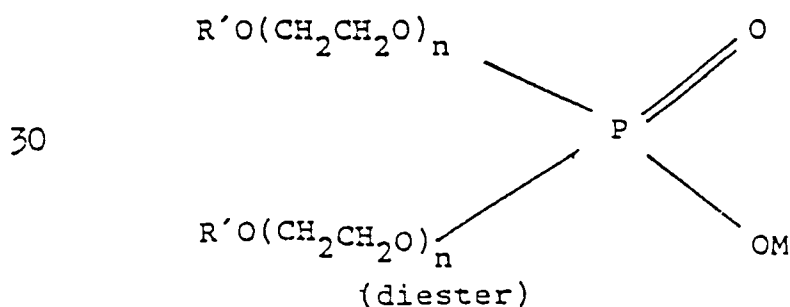
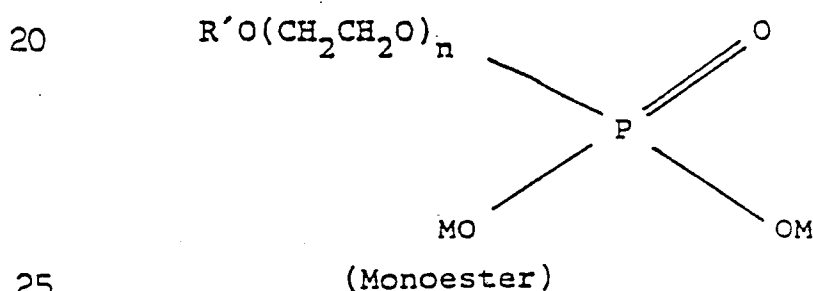
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Secondary alkane sulphonates containing 13 to 18 carbon atoms may also be used as the anionic surfactant. Suitable secondary alkane sulphonates include the sodium salt of secondary alkane sulphonate sold in the USA under 35 the trademark Hostapur SAS-60 by American Hoechst Corporation.

Useful anionic surfactants also include the xylene/toluene sulphonates. Suitable examples include sodium xylene sulphonate, sodium toluene sulphonate, ammonium xylene sulphonate, ammonium toluene sulphonate, and mixtures of these sulphonates. These compounds are often present in detergent compositions as hydrotropes.

Salts of fatty acids, ie, soaps, are also useful in the present compositions. Suitable soaps include sodium stearate, sodium tallowate, as well as the potassium, ammonium and mono-, di-, and triethanolamine salts of these acids. Mixtures of soaps are also useful.

Non-soap surfactants other than sulphates and sulphonates may be used. For example, the anionic surfactant may be of the phosphate mono- or diester type. These esters may be represented by the following formulas:



35 wherein R' is a fatty chain containing 10 to 18 carbon

atoms, n is 0 or an integer from 1 to 4, and M is any suitable cation such as alkali metal, ammonium and hydroxylalkyl ammonium.

- 5 Phosphate esters suitable in the present compositions include those sold in the USA under the trademark Gafac by the GAF Corporation.

 The anionic surfactant may also be of the type
10 wherein a fatty chain is attached to the anion of a carboxylic acid. Suitable anions of carboxylic acids include succinate, sulphosuccinate, and sarcosinate. Some typical surfactants of this type include sodium oleyl succinate, ammonium lauryl sulphosuccinate, and sodium
15 N-lauryl sarcosinate.

 When anionic surfactants are present in the compositions, less salt is required in order to achieve the same viscosity level than when no anionic surfactants are
20 present. Thus, as little as 2.5% by weight of the salt may be used. In order to form a viscous liquid containing an anionic surfactant, the concentration of the salt is preferably about 5 to 9% by weight. In order to form a thick paste or gel, the concentration of the salt is
25 preferably about 10 to 19% by weight.

 The concentration of the amido betaine depends on the concentration and identity of the salt and on the viscosity desired. Higher concentrations of betaine are
30 used as lower amounts of salt or less effective salts are present and as higher viscosities are desired. In order to form a viscous liquid, usually less than about 13% by weight of the amido betaine is present in the composition and generally between about 5 and 13%. When a thick paste
35 of gel is desired, usually more than about 13% of the amido betaine is present and generally between about 13 and 20%.

The third embodiment of the present invention is based on the discovery that some salts thicken compositions containing amide betaines only in the presence of anionic surfactant. Thus, these compositions contain as essential
5 components an amido betaine, a salt, an anionic surfactant, and water. In this embodiment the anionic surfactant is essential.

The amido betaine may be any of those described
10 above as being useful in compositions of the present invention where anionic surfactants are absent or optional. The anionic surfactants may be any of those described above for use in compositions which optionally contain anionic surfactants.

15

Salts which require the presence of anionic surfactants to promote thickening of aqueous compositions containing amido betaines include soluble sulphates of metals from Group IB of the Periodic Table such as copper
20 sulphate and silver sulphate; water-soluble alums such as potassium aluminium sulphate with the formula $KAl(SO_4)_2 \cdot 12H_2O$; alkali metal sesquicarbonates such as sodium sesquicarbonate; complex phosphate salts such as sodium tripolyphosphate, tetrapotassium pyrophosphate,
25 mixtures of tetrapotassium and tetrasodium pyrophosphate, especially those in the ratio of 8:1, the ammonium and hydroxyalkylammonium salts of these phosphates, and mixtures of these phosphate salts; certain salts of halogen acids selected from the group consisting of potassium
30 chloride and ammonium chloride; and alkali metal silicates such as sodium silicate. The ratio of silica to sodium oxide in the sodium silicate may be greater than one or less than one but is preferably greater than one. Some suitable sodium silicates include those with ratios of
35 silica to sodium oxide of 2.4, 3.22, 2.0, and 2.88. These

are available in the USA from the Philadelphia Quartz Corporation under the trade names sodium silicate RU, sodium silicate N, sodium silicate D, and sodium silicate K, respectively. The alkali metal silicate may also be
5 potassium silicate. Some suitable potassium silicates include those with ratios of silica to potassium oxide of 2.50, 2.10, and 2.20. These are sold in the USA by the Philadelphia Quartz Corporation under the trade names Kasil 1, Kasil 6, and Kasil 88, respectively.

10

The salts which require the presence of anionic surfactants in the present compositions may also be organic salts. The organic salts in this class include the alkali metal salts of acetic acid, and of nitrilotriacetic acid.

15

The preferred alkali metal salts of acetic acid are sodium acetate and potassium acetate. The preferred alkali metal salts of nitrilotriacetic acid are sodium nitrilotriacetic acid and potassium nitrilotriacetic acid.

20

The concentration of the amido betaines in the compositions of the third embodiment of the invention is 5 to 25% by weight and preferably 10 to 20% by weight.

25

The concentration of the micelle-forming anionic surfactant is preferably 0.25 to 4.0% and more preferably 1 to 2.5%. The concentration of the salts is 5 to 40% by weight and preferably 15 to 25% by weight.

30

As with the compositions of the first and second embodiments of the invention, the compositions of the third embodiment of the invention may be in the form of a viscous liquid, paste, or gel. The viscosity may range from 150 to 1 500 000 cps at ambient temperatures. At the low end of
35 the viscosity range are the viscous liquids. At the upper end are the pastes or gels.

The concentration of the salt depends on the type of composition desired. In order to form a viscous liquid, the concentration of the salt is preferably 10 to 19% by weight. If a paste of gel is desired, the concentration of the salts is preferably about 20 to 35% by weight.

The concentration of the betaine depends on the concentration and identity of the salt and on the type of composition desired. Higher concentrations of betaine are used as lower amounts of salt or less effective salts are present and as higher viscosities are desired. In order to form a viscous liquid, the concentration of the betaine is usually less than about 15% by weight and generally between about 10 and 15% by weight. If a paste or gel is desired, the concentration of the betaine is usually greater than about 15% and generally between about 15 and 25% by weight.

It has also been found that certain salts are unsuitable for use in the present invention under any circumstances. These salts are incapable of sufficient viscosity enhancement even in the presence of an anionic surfactant. Examples of inorganic salts which do not promote thickening under any of the present conditions include sodium bicarbonate, potassium bicarbonate, alkali metal nitrates such as sodium nitrate, borates such as sodium tetraborate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$), oxyhalides such as sodium chlorate, some salts of halogen acids such as sodium bromide, sodium chloride and potassium iodide, some salts of phosphoric acids such as orthophosphates and dibasic sodium phosphate (Na_2HPO_4) and salts of dichromic acid such as potassium dichromate. Examples of organic salts which do not promote thickening under any of the present conditions include sodium benzoate, disodium EDTA, sodium oxalate, and monopotassium phthalate.

The viscous liquids, pastes and gels of this invention are relatively simple and uncomplicated to prepare. The most convenient method is first to prepare a solution of the salt. Heating is applied if necessary to
5 effect dissolution. The alkylamido betaine is then added to the salt solution with agitation. A viscous liquid, paste, or gel forms immediately.

Generally, considerable air becomes entrained in the
10 composition. Upon standing, however, the composition de-aerates resulting in a clear, stable product.

If anionic surfactants or other optional ingredients are added to the composition, they may be added before or
15 after the addition of the alkylamido betaine.

The above preparation is but one of many ways in which the present compositions may be prepared. Although the order of mixing described is especially convenient, the
20 various ingredients can be added to the water in any order. Alternatively, the ingredients can be blended together and the mixtures added to water.

The compositions of the present invention are useful
25 in a large variety of applications. These applications include any composition which is advantageously thickened and in which the amido betaines, the salts, and, optionally, the anionic surfactants described above are effective ingredients.

30

The cocoamido betaines are amphoteric surfactants. Some of the salts useful in the present compositions, such as phosphates and carbonates, are detergency builders. Thus, the presently described compositions consisting
35 essentially of alkylamido betaines, salts, water, and, optionally, anionic surfactants, are useful in a variety of

cleansers in the absence of other ingredients which affect the essential nature of the cleanser, that is to say, the absence of other surfactants and builders.

5 Various types of cleansers are advantageously thickened. Viscous cleansers remain in contact longer with surfaces, especially vertical or dome-shaped surfaces. Thus, the present compositions are advantageously used as hand dishwashing products and a variety of other specialty
10 cleaners such as toilet bowl cleaners, wall cleaners, etc. Depending on the application, anionic surfactants may be added to the compositions.

 The present compositions may also be advantageously
15 used in a variety of cosmetic and toiletry products. The compositions are especially useful in shampoos.

 In addition to being useful without further ingredients, the compositions of this invention are
20 compatible with a large variety of optional materials. For example, the present compositions are stable in the presence of acids and bases, even when the pH is as low as 0.1 or lower and as high as 13 or higher. Other adjuvants such as abrasives, disinfectants, colourants, perfumes,
25 suds boosters, emollients and the like can be added to enhance consumer appeal and effectiveness.

 The invention is further illustrated by the following non-limiting Examples.

E X A M P L E S

EXAMPLES 1 AND 2

5 The following compositions represent gels prepared from cocoamido betaine and salts:

	<u>% by weight</u>		
	<u>1A</u>	<u>1B</u>	<u>1C</u>
10			
Cocoamido betaine	15.0	15.0	15.0
Sodium sulphate	20.0	-	-
15 Zinc sulphate	-	35.0	-
Sodium citrate, dihydrate	-	-	30.0
Water	<u>65.0</u>	<u>50.0</u>	<u>55.0</u>
	100.0	100.0	100.0
20 Brookfield viscosity (cps)	122 000	45 000	850 000
pH (as is)	5.32	3.87	7.06

	<u>% by weight</u>	
	<u>2A</u>	<u>2B</u>
25		
Cocoamido betaine	15.0	15.0
Potassium carbonate	15.0	-
30 Ammonium sulphate	-	20.0
Water	<u>70.0</u>	<u>65.0</u>
	100.0	100.0
Brookfield viscosity (cps)	2250	5000
35		
pH (as is)	10.98	5.28

EXAMPLE 3

This example illustrates the role of an anionic surfactant (alpha olefin sulphonate) in the formation of gels. When sodium sulphate is added at low concentration to a solution of cocoamido betaine, very little thickening occurs (3A). Similarly, low concentrations of alpha olefin sulphonate plus cocoamido betaine produce solutions of low viscosity (3B). However, low salt concentrations plus low anionic concentrations in combination with cocoamido betaine synergistically form high viscosity solutions and gels (3C-3F).

	<u>3A</u>	<u>3B</u>	<u>3C</u>	<u>3D</u>	<u>3E</u>	<u>3F</u>
Cocoamido betaine	15.0	15.0	15.0	15.0	15.0	15.0
Sodium sulphate	15.0	-	5.0	8.0	10.0	-
Alpha olefin sulphonate	-	2.4	2.4	2.4	2.4	12.4
Water	70.0	82.6	77.6	74.6	72.6	72.6
Brookfield viscosity (cps)	175	55	2600	21500	45000	21000

While this example cites alpha olefin sulphonate as the anionic, the invention is not, of course, limited to this type of anionic, but applies to other anionics as well.

EXAMPLE 4

30

This example illustrates a gel-form acidic toilet bowl cleaner. For cleaning vertical surfaces, particularly where prolonged contact with the cleaner is required, a viscous product which adheres rather than flows down the surface is of great advantage. The following represents such a product:

	<u>% by weight</u>
Cocoamido betaine	15.0
Sodium bisulphate	20.0
5 Colourant	0.0003
Water to	100.0
Brookfield viscosity (cps)	44 000
10 pH (as is)	0.13

EXAMPLE 5

15 The following composition is a viscous alkaline liquid which is well suited for the cleaning of soiled vertical surfaces such as walls, house sidings, etc. While intended for undiluted application, it may be applied in aqueous dilution to wash floors, and other hard surfaces.

20

	<u>% by weight</u>
Cocoamido betaine	12.0
Sodium citrate, dihydrate	20.0
25 Sodium silicate, 2.4 ratio	5.0
Colourant	0.0003
Perfume	0.2
Water to	100.0
30 Brookfield viscosity (cps)	2000
pH (as is)	11.5

EXAMPLE 6

The present invention is particularly useful for the preparation of highly viscous liquid or gel hand dishwashing products. Such "concentrates" can be dispensed
5 from squeeze tubes or plastic containers and present novel departures from the conventional hand dishwashing or light duty liquids. Viscous hand dishwashing products are advantageous for cleaning soiled pots and pans, because such products adhere to vertical pot and pan surfaces and
10 promote soil removal by virtue of their prolonged and intimate contact with the soil. A viscous hand dishwashing product thus can be effectively used for pretreating heavily soiled kitchenware.

15 The examples shown below represent hand dishwashing gels (6-A, 6-B, 6-C) and a conventional commercial hand dishwashing liquid control (6-D). The performance of these compositions, in terms of sudsing characteristics, were compared and found to be equal or superior to the control.
20 Assessment of sudsing characteristics was conducted by means of the Plunger Foam Breakdown Test which measures the durability of generated foams upon multiple additions of a fatty soil. Details of the Plunger Foam Breakdown Tests are as follows:

25

(1) Identical solutions of the experimental and the control detergents are prepared using distilled water.

(2) Portions of these detergent solutions of
30 known concentration are then equally diluted in graduated cylinders using a stock solution of water having a known hardness.

(3) The graduated cylinders are then immersed in
35 a water bath heated to 116°F, and allowed to reach

temperature equilibrium.

(4) The detergent solutions are then agitated by mechanically operated plungers at identical speeds for the same period of time. The resulting foam volumes formed in
5 each cylinder are then recorded.

(5) Equal increments of test soil are then added to each of the cylinders and plunger agitation is resumed for a fixed period.

10

(6) At the end of the period of agitation, the new foam volumes are recorded and the procedure in Step (5) is repeated until the foam volumes in the test cylinders have been depleted.

15

Results are expressed as the total of the foam volumes recorded for each detergent after addition of soil, as well as the number of soil increments required to deplete their foam levels. High foam volumes and numbers
20 of soil increments are indicative of the better performing products. The presence of a control product permits performance comparisons between experimental detergents and a commercial product. To obtain a complete sudsing profile of a particular detergent product, different concentrations
25 of the detergent are tested in hard and soft water.

Hand Dishwashing (Light Duty) Preparations

<u>% by weight</u>				
	<u>6-A</u>	<u>6-B</u>	<u>6-C</u>	<u>6-D</u> <u>(Control)</u>
5				
Cocoamido betaine	15.0	15.0	15.0	
Lauryl dimethyl amine	-	5.0	4.0	-
10 oxide				
Sodium lauryl sulphate	10.0	-	-	-
Sodium alcohol ethoxy	-	-	-	18.0
sulphate				
Ammonium alcoholethoxy	-	5.0	2.0	-
15 sulphate				
Ammonium xylene	-	-	-	2.0
sulphonate				
Ammonium alkylbenzene	-	-	-	13.5
sulphonate				
20 Lauric/myristic di-	-	-	-	5.0
ethanolamide				
Sodium sulphate	15.0	-	15.0	-
Sodium citrate, di-	-	10.0	-	-
hydrate				
25 Colourant	0.0002	0.0002	0.0002	0.0002
Perfume	0.15	0.15	0.15	0.15
Water to	100.0	100.0	100.0	100.0

Foam Volume ¹ (Plunger Foam Breakdown Test) and Soil
30 Additions¹

(a)

0.05% detergent conc.

175 ppm water hardness, ml	492.5	422.5	402.5	645.0
No. of soil additions	14.5	10.0	10.0	14.0

5

(b)

0.15% detergent conc.

25 ppm water hardness, ml	2125.0	1310.0	1107.5	1107.5
No. of soil additions	32.0	19.5	18.5	20.0

10

¹Mean value of duplicate determinations.

The above data show that the gel products with their 21-25% surfactant content perform well against a commercial control product having a considerably higher surfactant content, ie, 36.5%. Although the gel compositions do not exceed the sudsing performance of the commercial control product at low detergent concentration (0.05%) and higher water hardness (175 ppm), two of the gel compositions (6-A and 6-B) outperform the commercial product at high detergent concentration (0.15%) and low water hardness (25 ppm).

Composition 6-A is an opaque thick, smooth paste, Compositions 6-B and 6-C are clear gels; Control Composition 6-D is a mobile liquid. The gel-form compositions disperse readily with some agitation at water temperatures customary for hand dishwashing.

30 EXAMPLE 7

A viscous clear detergent-sanitizer gel was prepared as follows:

% by weight

	Cocoamido betaine	15.0
	Tetradecylbenzyldimethylammonium	
5	chloride, dihydrate	2.0
	Ethyl alcohol	0.5
	Sodium citrate, dihydrate	25.0
	Colourant	0.0004
	Water to	100.0
10	Brookfield viscosity (cps)	92 000
	pH (as is)	7.28

15

The detergent sanitizer composition of Example 7 is well suited for bathroom cleaning, because its viscosity will allow it to adhere and stay in prolonged contact with tile walls, toilet bowl, bath tub, etc.

20

EXAMPLE 8

This composition represents a gel-form shampoo which may be packed in and dispensed from a tube.

25

		<u>% by weight</u>
	Cocoamido betaine	15.0
	Alpha olefin sulphonate	2.4
	Sodium citrate, dihydrate	15.0
30	Colourant	0.0002
	Perfume	0.18
	Water to	100.0
	Brookfield viscosity (cps)	140 000
35	pH (as is)	6.4

EXAMPLE 9

Hand cleaners in gel form can be packed in wide mouth cans or jars, hence are convenient to use. They are not as messy as powder hand cleaners and can be formulated to be non-irritating to the skin and easily rinsible in water. The following formula represents a hand cleaning gel:

	<u>% by weight</u>
10 Cocamido betaine	13.6
Alphaolefin sulphonate	2.2
Sodium citrate, dihydrate	13.5
Calcite powder	10.0
15 Colourant	0.0003
Perfume	0.15
Water to	100.0
Brookfield viscosity (cps)	166 000
20 pH (as is)	8.6

EXAMPLE 10

25

The following examples further illustrate that small additions of different anionics to cocoamido betaine have no marked viscosity enhancing effect, but that such anionic additions in the presence of salts have a decided effect on viscosity even though the illustrated salts, at the levels used, do not contribute to increase viscosity without anionics. The combination of salts plus anionics behave synergistically, increasing composition viscosity considerably beyond the sum of the viscosities obtained by salt alone plus anionics alone.

EXAMPLE 10

		<u>% by weight</u>				
		<u>10A</u>	<u>10B</u>	<u>10C</u>	<u>10D</u>	<u>10E</u>
5	Cocoamido betaine	15.0	15.0	15.0	15.0	15.0
	Sodium sulphate	0	15.0	15.0	15.0	15.0
	Hostapur SAS-60 ¹	2.0	2.0	1.0	0.5	0
10	H ₂ O	83.0	68.0	69.0	69.5	70.0
	Brookfield viscosity (cps)	30	1060000	27000	500	50

15 ¹Secondary alkane sulphonate available from American Hoechst Corp.

		<u>% by weight</u>				
		<u>10F</u>	<u>10G</u>	<u>10H</u>	<u>10I</u>	<u>10J</u>
20	Cocoamido betaine	15.0	15.0	15.0	15.0	15.0
	Sodium sulphate	0	15.0	15.0	15.0	15.0
25	Magnesium alkylbenzene sulphonate	3.0	2.0	1.0	0.5	0
	H ₂ O	82.0	68.0	69.0	89.5	70.0
	Brookfield viscosity	105	288000	128000	600	50

		<u>% by weight</u>				
		<u>10K</u>	<u>10L</u>	<u>10M</u>	<u>10N</u>	<u>100</u>
5	Cocoamido betaine	15.0	15.0	15.0	15.0	15.0
	Sodium sulphate	0	15.0	15.0	15.0	15.0
	Gafac LO-529 ¹	3.0	2.0	1.0	0.5	0
	H ₂ O	82.0	68.0	69.0	69.5	70.0
10	Brookfield viscosity (cps)	35	13000	1500	250	50

¹Complex phosphate esters of nonionic surfactants of the ethylene-oxide-adduct type available from G.A.F.

15

		<u>% by weight</u>		
		<u>10P</u>	<u>10Q</u>	<u>10R</u>
20				
	Cocoamido betaine	15.0	15.0	15.0
	Sodium sulphate	0	15.0	15.0
	Sodium alkylbenzene sulphonate C ₁₂ -C ₁₄	2.0	2.0	0
25	H ₂ O	83.0	68.0	70.0
	Brookfield viscosity (cps)	15	56 000	50

30 EXAMPLE 11

The following examples illustrate the procedure used in preparing typical cocoamido betaine/salt and cocoamido betaine/salt/anionic surfactant gels:

EXAMPLE 11A

	<u>Component</u>	<u>% by weight</u>
5	H ₂ O	65.0
	Sodium sulphate	20.0
	Cocoamido betaine	<u>15.0</u>
		100.0

10

In Example 11A the sodium sulphate is added to the entire quantity of water required in the composition. The salt/water mixture is then stirred with a mechanical paddle mixer until the salts dissolve. (If necessary, the solution may be heated to facilitate the dissolving process.) Cocoamido betaine is then added to the stirred salt solution. A clear gel instantly forms having a viscosity of 122 000 cps. (Brookfield Viscometer)

20 EXAMPLE 11B

	<u>Component</u>	<u>% by weight</u>
25	H ₂ O	67.6
	Potassium acetate	15.0
	Cocamido betaine	15.0
	Alpha olefin sulphonate*	<u>2.4</u>
		100.0

30 *Bioterge AS-40 (Stepan)

In Example 11B, as in Example 11A, the cocoamido betaine is added to a solution of potassium acetate and water with mechanical paddle stirring. The anionic surfactant (alpha olefin sulphonate) is then added to the other three components resulting in a viscous product

having a viscosity of 3100 cps.

EXAMPLE 11C

5	<u>Component</u>	<u>% by weight</u>
	H ₂ O	65.0
	Sodium bisulphate	20.0
	Cocoamideo betaine	<u>15.0</u>
10		100.0

Example 11C is prepared exactly the same as Example 11A. The resulting product is a clear gel having a viscosity of 44 000 cps.

15

EXAMPLE 11D

	<u>Component</u>	<u>% by weight</u>
20	H ₂ O	67.8
	Copper sulphate	15.0
	Cocamido betaine	15.0
	Secondary alkane sulphonate*	2.2

25 * Hostapur SAS-60 ex American Hoechst Corporation.

Example 11D is prepared exactly the same as Example 11B. The resulting product is a viscous gel.

EXAMPLE 11E

	<u>Component</u>	<u>% by weight</u>
5	H ₂ O	60.0
	CMOS**	25.0
	Cocoamido betaine	<u>15.0</u>
		100.0

10 ** Sodium salt of carboxymethyloxysuccinate.

Example 11E is prepared exactly the same as Example 11A. The resulting clear gel has a viscosity of 560 000 cps.

15

Having now fully described the invention, it would be apparent to one of ordinary skill in the art that many changes and modifications can be made thereto without departing from the spirit or scope of the invention as set forth herein.

20

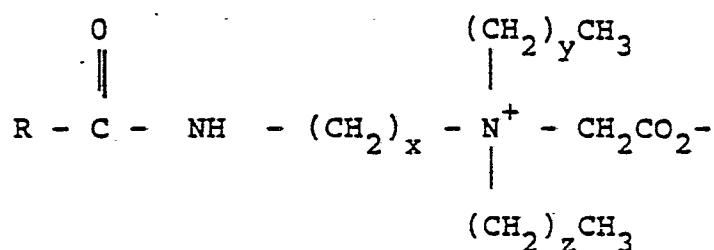
CLAIMS

1. An aqueous liquid, paste, or gel composition, characterised in that it comprises:

5

a) 5 to 25% by weight of one or more amido betaines of the general formula I:

10



15

(I)

wherein R is an alkyl or alkenyl chain containing 9 to 17 carbon atoms, x is an integer from 2 to 4, y is 0 or an integer from 1 to 3, and, z is 0 or an integer from 1 to 3;

b) 2.5 to 40% by weight of one or more water-soluble inorganic and/or organic salts, the inorganic salt being selected from the group consisting of:

30

b)(i) sulphates of metals from groups IA, IIA, IIB and IIIA of the Periodic Table, sulphates of non-metallic ions, and alkali metal carbonates,

and/or from the group consisting of:

b)(ii) sulphates of metals from group IB of the Periodic Table, alums, alkali metal sesquicarbonates, alkali metal tripolyphosphates and pyrophosphates, potassium chloride, ammonium chloride, and alkali metal

silicates;

the organic salt being incapable of forming micelles and being selected from the group consisting of:

5

b)(iii) the citrates, tartrates, succinates, and carboxymethyloxysuccinates of metals from Groups IA, IIA, IIB, and IIIA of the Periodic Table and the citrates, tartrates, succinates and carboxymethyloxysuccinates of
10 ammonium ions;

and/or from the group consisting of:

b)(iv) the alkali metal salts of acetic acid, and
15 the alkali metal salts of nitrilotriacetic acid;

c) optionally, one or more micelle-forming anionic surfactants, and

20 d) water,

with the proviso that when no anionic surfactant is present the salt or salts (b) is or are present in a total amount of at least 5% by weight, and is or are selected from
25 groups b(i) and/or b(iii) listed above,

the composition having a Brookfield viscosity within the range of from 150 to 1 500 000 cp at ambient temperature.

2. A composition as claimed in claim 1, characterised in that it comprises:

a) 5 to 25% by weight of the amidobetaine,

5

b) 5 to 40% by weight of one or more inorganic salts selected from group (b)(i) of claim 1 and/or one or more organic salts selected from group (b)(iii) of claim 1, and

10

c) water.

3. A composition as claimed in claim 1, characterised in that it comprises:

15

a) 5 to 25% by weight of the amidobetaine,

b) 2.5 to 40% by weight of one or more organic salts selected from group (b)(i) of claim 1 and/or one or more inorganic salts selected from group (b)(iii) of claim 1,

20

c) one or more micelle-forming anionic surfactants, and

25

d) water.

4. A composition as claimed in claim 3, characterised in that the anionic surfactant (c) is present in an amount of from 0.25 to 15% by weight.

30

5. A composition as claimed in claim 4, characterised in that the anionic surfactant is present in an amount of from 0.5 to 12.4% by weight.

6. A composition as claimed in claim 5, characterised in that the anionic surfactant is present in an amount of from 2.5 to 4.0% by weight.
- 5 7. A composition as claimed in claim 1, characterised in that it comprises:
- a) 5 to 25% by weight of the amidobetaine,
 - 10 b) 2.5 to 40% by weight of one or more inorganic salts selected from the group (b)(ii) of claim 1 and/or one or more organic salts selected from the group (b)(iv) of claim 1,
 - 15 c) one or more micelle-forming anionic surfactants, and
 - d) water.
- 20 8. A composition as claimed in claim 7, characterised in that the anionic surfactant is present in an amount of from 0.25 to 15% by weight.
- 25 9. A composition as claimed in claim 8, characterised in that the anionic surfactant is present in an amount of from 0.5 to 12.4% by weight.
- 30 10. A composition as claimed in claim 8, characterised in that the anionic surfactant is present in an amount of from 0.25 to 4.0% by weight.

11. A composition as claimed in any one of claims 3 to 10, characterised in that the anionic surfactant is selected from the group consisting of primary and secondary alkyl sulphates, alkyl ether sulphates, linear and branched
5 alkylbenzene sulphonates, secondary alkane sulphonates, alpha-olefin sulphonates and dialkyl sulphosuccinates.

12. A composition as claimed in any one of claims 1 to 11, characterised in that it is in the form of a viscous
10 liquid having a Brookfield viscosity at ambient temperatures of from 500 to 7500 cps.

13. A composition as claimed in claim 12, characterised in that the concentration of the salt is from 5 to 19% by
15 weight.

14. A composition as claimed in claim 13, characterised in that the concentration of the salt is from 10 to 19% by weight.
20

15. A composition as claimed in claim 13, characterised in that an anionic surfactant is present and the concentration of the salt is from 5 to 9% by weight.

25 16. A composition as claimed in any one of claims 13 to 15, characterised in that the concentration of the amido betaine is from 5 to 15% by weight.

17. A composition as claimed in claim 16, characterised
30 in that the concentration of the amido betaine is from 10 to 15% by weight.

18. A composition as claimed in claim 16, characterised in that an anionic surfactant is present and the
35 concentration of the amido betaine is from 5 to 13% by weight.

19. A composition as claimed in any one of claims 1 to 11, characterised in that it is in the form of a paste or gel having a Brookfield viscosity at ambient temperatures of from 100 000 to 1 000 000 cps.

5

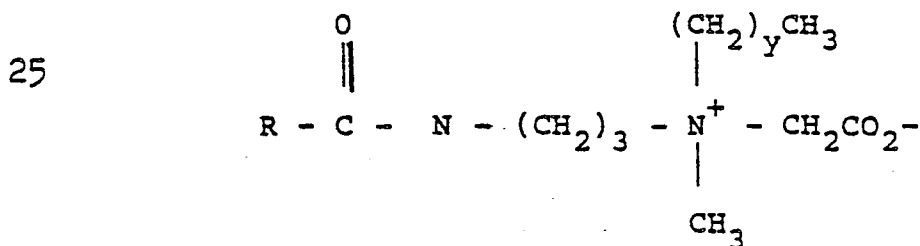
20. A composition as claimed in claim 19, characterised in that it is in the form of a paste or gel having a Brookfield viscosity at ambient temperatures of from 200 000 to 700 000 cps.

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21. A composition as claimed in claim 19 or claim 20, characterised in that the concentration of the salt is from 20 to 35% by weight.

15 22. A composition as claimed in any one of claims 19 to 21, characterised in that the concentration of the amido betaine is from 15 to 25% by weight.

23. A composition as claimed in any preceding claim, 20 characterised in that the amido betaine is represented by the formula:



(II)

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wherein R represents the mixture of alkyl radicals from coconut oil fatty acid.